BCMB30002 Functional Genomics and Bioinformatics

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2011, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: three x 1 hour lecture, and one x 1 hour tutorial per week. Total Time Commitment: 48 contact hours with an estimated total time commitment of 120 hours.
Prerequisites:	BSc students Before 2009: Biochemistry & Molecular Biology Part A (521-211) Biochemistry & Molecular Biology Part B (521-212) 2009 and subsequently: **Subject** / **Study Period Commencement:** / **Credit Points:** BCMB20002 Biochemistry and Molecular Biology — Semester 1, Semester 2 — 12.50 Note that the pre-2009 subject “Biochemistry & Molecular Biology Part A” and the 2009 subject “Biochemistry & Molecular Biology” are not identical despite having the same subject code. Only the subject “Biochemistry & Molecular Biology” offered in 2009 and subsequently acts as a stand-alone prerequisite. Other combinations that provide similar background will be considered by the coordinator. **BBiomedicine students** **Subject** / **Study Period Commencement:** / **Credit Points:** BIOM20001 Molecular and Cellular Biomedicine — Semester 1 — 25 BBiomedSc students (pre-2009) 521-213 Integrated Biomedical Science I 536-250 Integrated Biomedical Science II
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students cannot enrol in and gain credit for this subject if previously obtained credit for pre-2009 subject 521-302 Functional Genomics. BBiomedSc students who have received credit for 521-308 Genome Science are not permitted to enrol and gain credit for this subject.
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry. The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
Coordinator:	Dr Alana Mitchell
Contact:	**amitch@unimelb.edu.au (mailto:amitch@unimelb.edu.au)**
Subject Overview:	Knowledge of genome structures from various organisms and the rapid development of technologies that exploit such information are having a big impact in biology, medicine and biotechnology. This subject describes the structure and expression of genomes in higher organisms and provides an understanding of the technologies used to analyse and manipulate

	genes. Students will learn how the modification of genes in cells and whole organisms can be used to discover gene function or to modify phenotype. The structure of eukaryotic chromosomes is presented to demonstrate how genetic material is replicated and how transcription of RNA is controlled. We illustrate how pathways that regulate RNA and protein are integrated to control cell metabolism and cell fate. The content will cover the bioinformatic techniques used to interpret and extend genomic information. The approaches of functional genomics will be discussed in relation to cancer to illustrate the application of molecular biology to the study of human biology and health.
Objectives:	By the end of the subject, the student should understand: # current concepts concerning the molecular bases of genome structure and the regulation of gene expression in eukaryotic organisms (yeast, animals and plants) # the role of gene regulatory networks in controlling metabolic and developmental pathways # the theory of recombinant DNA technology and how it is applied in biomedicine and biotechnology # the significance and applications of genome sequencing programs; # bioinformatic techniques and their applications # how gene function can be investigated by recombinant DNA techniques and genetic manipulation of cell lines and whole organisms (transgenesis and targeted mutation); # how functional genomics can be applied in the study of human diseases such as cancer.
Assessment:	3 hour written exam held in examination period (70%); two 1 hour written examinations held during semester (7.5% x 2 = 15%); 1,000 word essay assessment due mid-semester (15%).
Prescribed Texts:	Alberts et al, Molecular Biology of the Cell, 5th edition
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	On completion of this subject, students should have developed the following generic skills: # the ability to interpret scientific literature and interpret data from electronic databases. # the capacity to integrate knowledge across disciplines. # the ability to comprehend a question, evaluate the relevant information and communicate an answer.
Notes:	Students enrolled in the BSc (pre-2008 BSc), BASc or a combined BSc course will receive science credit for the completion of this subject. Students undertaking this subject will be expected to regularly access an internet-enabled computer.
Related Course(s):	Bachelor of Biomedical Science Bachelor of Science Master of Biotechnology
Related Majors/Minors/ Specialisations:	Agri-food Biotechnology (specialisation of Biotechnology major) Animal Cell Biology (specialisation of Cell and Developmental Biology major) Biochemistry and Molecular Biology Biomedical Biotechnology (specialisation of Biotechnology major) Biotechnology (pre-2008 Bachelor of Science) Cell Biology (pre-2008 Bachelor of Science) Reproduction and Development (specialisation of Cell and Developmental Biology major) Science credit subjects* for pre-2008 BSc, BASc and combined degree science courses